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ABSTRACT

Computer assisted instruction can be used for stimulating rhetorical invention in English composition. The computer program is responsible for the direction of the inquiry and the motivational sequence while the writer is responsible for the content. The resulting interaction raises to the conscious level what writers already know about their subjects and makes them write down their ideas. The computer programs also have the ability to ask questions to which writers don't yet know the answers. Such dialogues, by generating some dissonance, prompt writers to articulate problems that the computer-cued interaction uncovers. The computer can also provide approximately 560 conference hours teaching invention as well as print students' copies of their interactions. Computer tasks need not be a pedagogical bed of drill and practice sequences alone, but can be a creative, open-ended, problem solving application of instructional computing. (HOD)

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A WRITER'S TOOL:
COMPUTING AS A MODE OF INVENTING

by

Hugh Burns

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Over the past three years, I've been designing, programming, and evaluating practical computer-assisted instruction (CAI) for stimulating rhetorical invention in English composition. The basic idea is simple enough. In terms of creativity theory (Koestler, The Art of Creation, 1964), these computer programs generate the first vector by asking a specific heuristic question, and the writer generates the second vector by giving a knowledgeable answer. In other words, the computer program is responsible for the direction of the inquiry and the motivational sequence while the writer is responsible for the content. The resulting interaction thus raises to the conscious level what writers already know about their subjects and makes them write down their ideas. Also, the programs have an uncanny ability to ask questions that writers don't know the answers to yet. Th is such dialogues, by generating some dissonance, prompt writers to articulate problems which the computer-cued interaction uncovers.

After teaching composition for a number of years, I became convinced that I needed to teach more about invention. I assumed then (and still do assume) that students frequently failed to write insightfully because they did not inquire carefully enough. I'm sure you've heard such lines before as "I don't know what to write about. What can I say about this topic anyway?" Substitute the range of topics we normally see in college composition courses and you have the problem,

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the challenge. Just what can you tell a student at this stage in the writing process. What could I do to spur each individual's invention process along? While I could not hope to teach insight, I could prompt students to answer questions. In fact, I could ask questions based on Aristotle's enthymeme topoi, Kenneth Burke's pentad, and the Young-Becker-Pike tagmemic matrix. I also could explain the question if the student didn't understand the basic idea or didn't know a definition. I could usually prompt a student to elaborate an answer. And I could encourage students by not rushing them and by giving them positive reinforcement if they answered the question sensibly. What I couldn't do--mentally or physically--was meet all eighty of my composition students seven times a semester for thirty to sixty minutes just to guide their initial inquiry. That's about 560 conference hours teaching invention alone. Impossible. But the computer in the writing lab could do it. Eureka! There were enough terminals. Our university already had some CAI in basic composition. Other advantages? The computer in the lab could also print each student a copy of his or her interaction; I could not. More ideas came. I could compare these three popular heuristic strategies for their effectiveness. The computer could control the experiment.

Everyday, I became more and more intrigued by the nature and the potential of these programs. It was soon quite clear to me that if we in the humanities must have a machine in our garden, we humanists better create the tasks it should help us with: not a pedagogical bed of drill and practice sequences alone, but a creative, open-ended, problem-solving application of instructional computing. That was three years ago. Today these programs have been called such names as "artificial inquiry," "electronic brainstorming," and even "Socratic Systems, Incorporated." After three years, therefore, I'm happy to report that a computer can be programmed to do some, if not all, of these inventive things. Yes, this calculating engine has a place in our humanities garden as a prewriter's tool.

How does one of these programs work? What does it look like? Here's part of a "run" that one of my American literature students created using the tagmemic matrix program (her responses are underlined):

A COMPUTER-ASSISTED INVENTION PROGRAM:
THE TAGMEMIC MATRIX

HI. WELCOME TO CAI-PROMPTED EXPLORATION.

PLEASE TYPE IN YOUR FIRST NAME: KAREN

THANK YOU, KAREN. I HOPE I CAN BE OF SOME ASSISTANCE TO YOU TODAY. IF WE TAKE EACH OTHER SERIOUSLY, I KNOW YOU'LL THINK ABOUT YOUR TOPIC AS YOU NEVER HAVE BEFORE.

BEFORE WE BEGIN, KAREN, THERE'S AN OLD SAYING ABOUT COMPUTER-ASSISTED INSTRUCTION. IT READS:

"GARBAGE IN, GARBAGE OUT!"

IN OTHER WORDS, YOU AND I MUST COOPERATE SO THAT YOU CAN GET A GOOD START ON YOUR RESEARCH PAPER.

WOULD YOU LIKE TO REVIEW THE DIRECTIONS AND THE COMMANDS?

(YES OR NO?)

NO

DO YOU WISH TO SEE A SHORT DESCRIPTION OF THE TAGMEMIC MATRIX?

(YES OR NO?)

YES

THE TAGMEMIC MATRIX HEURISTIC:

BRIEFLY, THE TAGMEMIC MATRIX ENCOURAGES A WRITER TO THINK ABOUT A TOPIC FROM NINE PERSPECTIVES.

FOR THIS PROGRAM, HOWEVER, I HAVE SIMPLIFIED THIS A BIT. THIS PROGRAM WILL ASK YOU QUESTIONS FROM ONLY THREE PERSPECTIVES, WHICH YOU WILL RECALL FROM OUR CLASS DISCUSSION.

1. PARTICLE--VIEWING A SUBJECT IN ITSELF (STATIC);
2. WAVE--VIEWING A SUBJECT AS IT CHANGES (DYNAMIC); AND
3. FIELD--VIEWING A SUBJECT'S RELATIONSHIP TO OTHER SUBJECTS (IN A SYSTEM).

NOW I MUST ASK YOU WHAT YOU ARE WRITING ABOUT, SO WOULD YOU PLEASE TYPE IN YOUR SUBJECT. (I'M LOOKING FOR ONE TO THREE WORDS, MAYBE FOUR.)

DREISER'S DRAMATIC TECHNIQUE

HEY, THAT'S COOL, KAREN! WE'LL HAVE A GOOD TIME BRAINSTORMING DREISER'S DRAMATIC TECHNIQUE.

A COMMENT ABOUT PURPOSE:

WRITING WITHOUT A PURPOSE OR AIM, KAREN, IS QUITE FRANKLY A WASTE OF TIME. DOING SO GENERATES VERBAL FOG, DESTROYS WRITING EFFICIENCY, AND DEFEATS THE ESSENCE OF COMMUNICATION.

THEREFORE, THROUGHOUT THIS EXPLORATION PROCESS, YOU WILL BE ASKED TO WRITE ABOUT THE PURPOSE OF YOUR PAPER. SO NOW WOULD YOU BRIEFLY DESCRIBE THE PURPOSE OF YOUR PAPER BY COMPLETING THIS STATEMENT:

THE PURPOSE OF MY PAPER IS TO. . . .

EXPLAIN HOW DREISER USES DETAILS TO GO BEYOND MELODRAMA.

ANYTHING ELSE?

YES

WHAT?

AND TO SHOW HOW DETAILS OF CHARACTER ARE PART OF HIS DRAMATIC STRUCTURE

FINE, KAREN, YOU AND I WILL TALK AGAIN ABOUT YOUR PURPOSE.

HERE WE GO. RELAX AND ENJOY THE MIND-STRETCHING.

QUESTION 1

DESCRIBE HOW DREISER'S DRAMATIC TECHNIQUE PHYSICALLY CHANGES.

PLEASE EXPLAIN!

I'M LOOKING FOR YOUR NOTIONS ABOUT THE DEVELOPMENT OF DREISER'S DRAMATIC TECHNIQUE. . . .

FOR EXAMPLE, IF I WERE WRITING ABOUT ANOTHER SUBJECT, SAY HUMAN DEVELOPMENT, I WOULD WRITE ABOUT GROWTH, THE CHANGES THAT ARE DUE TO MATURING. YOU KNOW ADULT "PASSAGES" HAVE BEEN POPULAR FARE LATELY.

YOUR TURN, KAREN.

I WANT TO SHOW HOW SISTER CARRIE ALLOWED DREISER TO GROW, TO CONFRONT COMMON VALUES. IT IS A MATURE WORK.

GOOD, KAREN. ADD TO YOUR RESPONSE NOW.

HURSTWOOD GROWS THE OTHER WAY. THERE ARE NEGATIVE PASSAGES, AREN'T THERE?

YES, THAT SEEMS OKAY TO ME.

ME TOO.

AH, SHORT AND SWEET. PLEASE ELABORATE A LITTLE.

WELL, CHARACTERS EITHER GET WORSE OR BETTER; THEY EITHER PASS TO A BETTER UNDERSTANDING OR NOT.

TERRIFIC, KAREN!

ANYTHING ELSE?

SOMETIMES HIS DETAILS GET IN THE WAY OF HIS ORGANIZATION AND HIS EFFECTIVENESS--BUT CONTINUE!

OKAY.

(ALL IDEAS ARE GOOD IDEAS; TYPE IN WHAT YOU THINK!!!!)

QUESTION 2--ONE OF MY FAVORITES--COMING UP:

TAKE A MENTAL PHOTOGRAPH OF DREISER'S DRAMATIC TECHNIQUE. DESCRIBE ONE IMPORTANT DETAIL.

I DON'T UNDERSTAND WHAT YOU WANT ME TO SAY

CONCENTRATE NOW ON SEEING DREISER'S DRAMATIC TECHNIQUE. WHAT FEATURE STANDS OUT THE MOST? DESCRIBE.

YOUR TURN, KAREN.

LIKE THE SETTINGS?

YES, THAT SEEMS OKAY.

THE FACTORY VS THE HOTEL.

THAT'S THE IDEA, KAREN. GIVE ME SOME MORE INFORMATION.

I SEE HURSTWOOD AS A SCAB. THOUGH HE'S BEEN REDUCED, HE STILL HAS SOME DIGNITY. BUT THE SETTINGS AREN'T DIGNIFIED. THE STREET&&

GO ON, KAREN.

THE STREETS ARE UGLY, DISMAL. CONTRAST.

SUPER, KAREN!

ANYTHING ELSE?

YES

WHAT?

I SEE SUFFERING AND COMMITMENT DESPITE IT BECAUSE HURSTWOOD HAS BOTH KINDS OF EXPERIENCE.

THAT'S AN INTERESTING REASON.

ANYTHING ELSE?

WHY DO YOU THINK THIS QUESTION IS ONE OF YOUR FAVORITES?

WHY NOT, KAREN? REMEMBER WE'RE EXPLORING FOR ANSWERS.

HOW DO YOU SEE HURSTWOOD'S SUFFERING. IS IT A PASSAGE?

I CAN'T PRETEND TO KNOW HOW, BUT YOU'VE ASKED AN IMPORTANT QUESTION. REMEMBER IT.

DO YOU WISH TO NARROW OR CHANGE YOUR TOPIC? MAYBE REVISE THE WAY IT SOUNDS IN THESE QUESTIONS?

NO.

OKAY, LET'S GO ON. . . .

Karen worked for about forty minutes. She commented twice more on her purpose as the program continued to ask ten more tagmemic questions. The program told her that she elaborated (i.e., answered a question at least twice) 75 percent of the time. It also told her that she was asked four particle questions, six wave questions, and two field questions. Twice she explicitly asked for wave questions since she sensed that this specific, dynamic perspective was useful to her own inquiry. When she "logged out," she left with eighteen pages of transcript.

We all know a rhetorical renaissance has recently emerged within the teaching of English composition, but most of us aren't as ready or as eager to admit that an electronic revolution has emerged as well. What such programs illustrate above all else is that rhetorical invention and computer technology are indeed compatible; combing heuristic "modes" and computer "media" can well serve and gladly teach the inquisitive writer. Stimulating invention in English composition through computer-assisted instruction is, I'm convinced, an effective, supplementary way to begin teaching the art of systematic inquiry. It is also a most appropriate introduction to the richness of heuristic strategies in general.

A Writer's Tool

Look for creative computing approaches to enrich what we humanists can do. We have a tool, but we must use it well. After all, if this machine is already here, shouldn't we humanists be the ones to till the garden we all labor in?

Major Hugh Burns is an Associate Professor of English at the United States Air Force Academy in Colorado.